THE OPTICAL
MAGIC LANTERN
JOURNAL
AND
PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

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NOTICE.

MANY CORRESPONDENTS STILL FORWARD THEIR COMMUNICATIONS TO THE OLD ADDRESS. WILL THEY PLEASE NOTE THAT OUR ADDRESS IS NOW

56, CHANCERY LANE, LONDON, W.C.

Notes.

ENCOURAGED by the success of the St. Pancras district, the Islington Vestry, have also decided to use the electric light for general illumination.

* * *

THE word Kodak in large gilt letters now occupies a prominent position on the front of the Oxford Street premises of the Eastman Photographic Materials Company.

* * *

THE partnership heretofore subsisting, between Joseph Challender and Samuel Oldham Lees, carrying on business at 114, Princess Street, Manchester, under the style of "The Gas Compression Company," has been dissolved. All debts due to and owing by the said late firm will be received and paid by the said Joseph Challender, who will in future carry on the said business under the same style and at the same address.

* * *

ON another page Mr. Moss calls attention to the scarcity of good half hour tales, illustrated with slides suitable for Band of Hope and Sunday School work. Mr. Moss states that goody goody or preaching is not wanted for entertainments and that he fails to see what good it will do us to have our sympathies awakened—children do not always care to go to an entertainment which finishes up with a good cry.

When on a visit to the East, the Crown Princess of Norway and Sweden took over 2,000 negatives with a hand camera. Lantern slides are to be made from the best, and her Royal Highness is to give a series of lantern entertainments to her friends during the winter.

* * *

It is estimated that about 300,000,000 hen's eggs are used in the United States annually in connection with the manufacture of albumnized paper.

* * *

Recent experiments demonstrate that zinc oxide when incandescent becomes exceedingly luminous at a temperature above 880° Cent. The phenomenon belongs to a class described as the "Phosphorescence of heat." This abnormal brightness, which is due to something else than ordinary incandescence, has been observed in other oxides. Cylinders of lime, when freshly ignited in the oxy-hydrogen flame, also exhibit a momentary brilliance not afterwards observed. The brightness of the magnesium flame may be of 3000° Cent, yet the actual temperature of the flame as measured, is only 1400° Cent. The phenomenon like ordinary phosphorescence is a mystery at present.

* * *

The manufacture of artificial india-rubber for tubing and other purposes has lately been protected by patent. The component parts of this composition are manilla gum, benzine, bitumen, and resin oil. It is said that the product obtained from careful admixture and special treatment of these materials gives a substance which possesses all the elasticity, solidity, and suppleness of the finest india-rubber.

* * *

We have all heard of the power of the sun's rays. In New York lately, these, by the agency of lenses recently set fire to a building and damaged about fifty pounds worth of goods. It appears that the lenses of a Solar enlarging apparatus of Messrs. Rockwood & Co., were left uncovered when not in use, these focussed the solar rays on woodwork, the result of which is stated above.

* * *

The *New York Recorder* is endeavouring to increase its circulation by giving a hand camera together with a copy of the paper for a specified time for a certain amount.

* * *

The camera mentioned in the foregoing paragraph, is evidently of a totally different kind from any thing hitherto introduced:—According to the description which the owners of the paper give, "It is incased in ebonite with an achromate lens. That means that it can take pictures at any distance beyond eight feet without any troublesome focussing . . . . *push* a *string* and turn a key." A testimonial from the Editor of the *Camera and Tripod* then follows, in which he explains that pictures taken with these cameras, "do not have the distortion and bad perspective found in other fixed focus cameras." It might be interesting to know the relation of the covering of the camera, &c., to the distance beyond which objects are in focus, also in what way this particular camera differs from the others spoken of by the Editor of the paper mentioned.

Stereoscopic Effect with Bi-Unial Lantern.

By One who has Seen It.

Since Wheatstone, over fifty years ago, startled the scientific world by his theories of binocular vision, and the invention of the reflecting stereoscope, many attempts have been made to apply the principle to pictures projected upon a screen from optical lanterns.

In the greater number of these attempts the two pictures of a stereoscopic pair have been projected side by side, or one above the other, and a pair of prisms used to reflect one picture only to each eye. Obviously, to effect this satisfactorily, the observer must be in one position, and any system, therefore, of this character, must fail in the one important point—that a number of observers cannot see the effect at the same time.

To overcome this difficulty the two pictures can be superposed upon the screen, but how then can one picture, and one only, of the two equally bright pictures be conveyed to the right eye and the other to the left eye? It must be remembered that it is a necessity of stereoscopic vision, that one picture of the pair fall upon the retina of one eye, and the other picture upon a corresponding portion of the retina of the other.

This was the problem to be solved with superposed pictures, and hitherto no satisfactory solution of it has been made. To overcome the the difficulty the inventor of the new system, Mr. John Anderton, of the firm of R. Field & Co., Opticians, Birmingham, takes advantage of the peculiar properties possessed by polarised light. It would be out of place here to refer to the nature of light when polarised, it must suffice to state that ordinary light, after passing through certain substances, or after being reflected from certain materials, is found to have undergone a great and mysterious change.

It may now be said to have parted with one half of itself.

The methods adopted for polarising the light and making the polarised light available for the purpose required, are briefly these: In front of each objective of an ordinary pair of lanterns a number of thin plates of glass are placed at the required angle, the light passes through these and the image of the slide is duly projected upon the screen. This picture, say from the top lantern, has nothing whatever to distinguish it from an ordinary one when seen by the unaided eye, but if it be looked at through a number of plates of thin glass held at an angle, it will be seen to possess peculiar properties, for in one position it will be clearly seen. If now the thin glass plates be turned through a quarter of a circle, the view nearly disappears, turned through another quarter it appears again. It will therefore be seen that the means are at disposal to either allow the picture on the screen to be seen, or to be, as it were, shut out, and also that whether it be visible or lost to sight entirely depends upon the position in which the glasses are held with regard to those in the lantern.

Let us suppose that the thin glass plates forming the polariser in the top lantern of a bi-unial are placed north and south. If, now, the picture on the screen be looked at through the glasses held north and south, it is seen practically as clearly as if nothing were between the eye and screen. If, however, they are turned to east and west the picture disappears. Let the thin glass plates forming the polariser in the bottom lantern be placed east and west, the polariser in the top one remaining north and south. We have now two pictures on the screen. Let these be now looked at through the thin glass plates (the analyser), and it will be seen that when they are held north and south, the picture projected by the top lantern, in which the plates are north and south, will be clearly seen, whilst the picture from the bottom lantern in which the plates are east and west will have disappeared. Turn the plates to a position of east and west and the picture from the bottom lantern appears, and that from the top lantern disappears. If then we have a number of thin glass plates for each eye, the one lot being held north and south, and the other east and west, it is obvious that the former will allow only the picture of the top lantern to reach one eye, and equally obvious that the latter will permit the picture from the bottom to reach the other eye, and that one only. The conditions, therefore, under which two flat pictures can be made to appear with stereoscopic effect are fulfilled, and one picture only is seen in relief. The pictures, 10 feet in diameter, are projected upon a screen of calico covered with dead silver paper, the latter being a necessity as a linen screen or white wall destroys the polarisation.

The system may appear to be a complex one from the explanation, in reality it is extremely simple. The polarisers have simply to be placed in position, and the two lanterns turned on. There is no adjustment required, and the polarisers can be removed, when not needed, in a few seconds. The thin glasses or analysers through which the pictures are viewed, are mounted in a frame similar to an opera glass, but very much smaller and lighter. The tubes being but one inch and a quarter in length, and a trifle less than this in diameter.

As the two pictures of a stereoscopic pair are dissimilar, they cannot properly be superimposed, and the effect as seen by the unaided eye is a confused picture double in parts. When looked at through the analysers one picture and one only is seen, and that with the relief given by the stereoscope to a stereoscopic slide.

Colored as well as ordinary photographs can be exhibited satisfactorily, and any number of observers can see the pictures at the same time.

In this description no attempt has been made to explain how a clear picture can be obtained after the rays have passed through a number of thin plates, nor how a clear view of the picture can be seen through analysers also made of thin glass plates. It must suffice how, to state that these difficulties have been overcome.

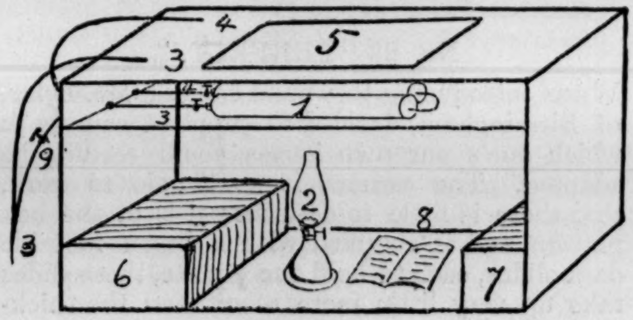
—:o:—

How I Warm my Saturator.

By Edwd. Luckett.

I do not consider that Mr. Pumphrey is correct when he says that saturators have had their day, as the best light can be obtained from them with a minimum of trouble and considerably less cost than with two gas cylinders.

I give below the plan I adopt for warming my saturator. My lantern box I use as a stand for the lantern, and place the saturator on an



open shelf inside the box, with a small lamp underneath which keeps it warm. The lamp is kept burning throughout the lecture and plays a double part—keeping the saturator warm and affording a light to see the reading or the position of the slides. As the lamp is inside of the box it requires no shield, and cannot be seen by the audience. The door of the box is taken completely off. The wooden frame with which saturators are usually provided is dispensed with. The saturator shonld have at least one tap to regulate the flow of oxygen, but in my practice I find it best to have two taps between the saturator and cylinder in addition to the regulator.

In the foregoing sketch the following letters will explain the parts :—

1. Saturator.
2. Small lamp.
3. Oxygen tube from Cylinder to Saturator and jet joined with a Y piece.
4. Tube from Saturator to jet.
5. Lantern.
6. Framed Slides.
7. Unframed Slides.
8. Reading.
9. Extra tap to regulate oxygen to Saturator.

—:o:—

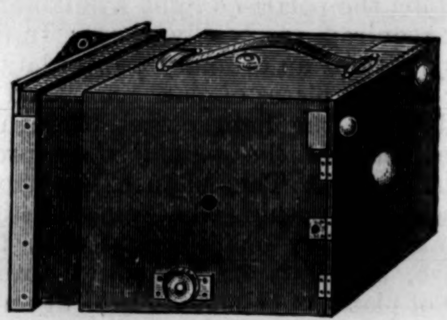
Hand-Cameras for Obtaining Slides for the Lantern.

		"Facile"	(Fallowfield)	see March 1st, 1890
No.	1	"Giah"	(Mawson & Swan)	,, May 1st, ,,
,,	2	"Quadrant"	(W. H. Humphries & Co.)	,, June 1st, ,,
,,	3	"Eclipse"	(J. F. Shew & Co.)	,, July 1st, ,,
,,	4	"Eureka"	(W. W. Rouch & Co.)	,, Aug. 1st, ,,
,,	5	"Key"	(Platinotype Co.)	,, Sept. 1st, ,,
,,	6	"Optimus"	(Perken, Son & Rayment)	,, Oct. 1st, ,,
,,	7	"The Griffin"	(Griffin & Sons, Limited)	,, Nov. 1st, ,,
,,	8	"The Swinden-Earp" Patent		,, Dec. 1st, ,,
,,	9	"Collins"	(C. G. Collins)	,, Feb. 1st, 1891.
,,	10	"Kodak"	(Eastman Co.)	,, Mar. 1st, ,,
,,	11	"Guinea"	(Walter Griffith)	,, April 1st, ,,
,,	12	"Vanneck"	(Watson & Sons)	,, May 1st, ,,
,,	13	"Chadwicks"	(W. I. Chadwiek)	,, June 1st, ,,
,,	14	"Bonanza"	(R. & A J. Mercer)	,, July 1st, ,,
,,	15	"Repeater"	(J. F. Shew & Co.)	,, Aug. 1st. ,,
,,	16	"Marvel"	(Wilson & Son)	,, Sept. 1st. ,,
,,	17	"Talmer"	(Talbot & Eamer)	,, Oct. 1st, ,,
,,	18	"The Omnigraph"	(J. Lancaster & Son)	,, Nov. 1st, ,,
,,	19	"Ubique	(Perken, Son & Rayment)	,, May 1st, 1892.
,,	20	"Daylight Kodak"	(Eastman Company)	,, June 1st, ,,
,,	21	"The Radial"	(Marion & Co.)	,, July 1st, ,,
,,	22	"The Surprise"	(Levi & Co.)	,, August 1st, ,,

No. 23 "PERFECT."

WHEN introducing this hand camera Mr. Tylar, of Birmingham, decided to supply a camera to which one's our own lenses could readily be adapted. The camera is so simple to work, that there is little to describe; it is of the box pattern, and is supplied with a dozen metallic dark slides, each to hold one ¼ plate, these slides take up very little more room than the thickness of the glass.

The front which is to carry the lens, is set back from the shutter to such a distance as will permit of almost any special make of lens being used, whilst the aperture in the front of the box is 1¾ inches in diameter. A milled head at the lower part enables the picture to be focussed, there being a range of from 4½ to 6 inches. This racks out the back portion of the camera, enabling the distance between the lens and the shutter to remain the same.



Both horizontal and vertical finders are provided, also a ground glass.

The camera can of course be used on a stand, and time exposure given with a cap, but for instantaneous work a suitable shutter is provided, this opens in two leaves, which meet across the centre of the lens.

The instrument is made of mahogany and measures 5½ × 4¼ × 6½ inches.

Mr. Tylar recently exposed six or seven dozen plates with this camera, during a holiday to the Channel Islands, and intends making lantern slides from the negatives, and placing them, during the season, in the hands of Secretaries of any Photographic or other Society who would like to exhibit them before their members.

This camera is also made in a twin form, which enables the operator to see the view on the top, of the exact size in which it willa ppear in the negative.

—:o:—

Outdoor Lantern Illustration.

BY ALFRED WATKINS.

I HAVE recently organized a scheme of practical instruction for rural districts in Herefordshire on the subject of bee-keeping, under a grant from the County Council. The method adopted is to send a properly equipped travelling van from village to village, giving lectures and practical instruction at each place.

The original idea was to give an evening talk from the platform of the van, illustrating the remarks with the aid of diagrams and modern bee-keeping appliances.

The idea struck me to supplement this with a short additional lecture, illustrated with a series of photographic slides, which I have prepared on the subject, and using the lantern for the purpose.

As the result has been a complete success, in spite of the fact that the tour has taken place during the long summer evenings, I think some details may be of interest.

The van was built to order—a one horse one, about 11 ft. long by 6 ft. wide. In the front is a central door. Three parts of the back end of the van lets down, like the tail board of a waggon, to form a lecturing platform; the remaining part lifts up as a flap. The end of the van is therefore perfectly open, and in the opening a muslin screen is let down from an ordinary blind roller, the lath at the bottom of the screen catches under two cleats on the floor, and two or three tapes on each side strains it tight.

The lantern is placed in the open doorway of the van (lens 10 ft. 6 in. from screen), and a 5 ft. picture is shown. A 40 ft. oxygen cylinder, with Beards Regulator is used, with a Turnbull spirit jet.

The instructor had never seen a lantern at work, but with one trial before starting, and my help at the first lecture, no serious difficulties have been found. He lights up, and adjusts the lantern; his son (who sleeps with him in the van) changes the slides while he lectures at the front. The lecture lasts 30 to 35 minutes, and it is dark enough to commence at 9.15 on the longest day. About 2 ft. of gas is used each time.

The spirit jet works admirably; when the wick is once set it does not require adjusting again, and is not even charred yet. We find it best to measure out ½ pint of spirit each time, and throw away what is left. At first the lamp was filled from a quart can and the remainder poured back. The result was that the stock in the can became weaker, until one evening it refused to give any light.

A larger audience is usually drawn to the lantern lecture than to the instruction which is given earlier in the evening (at 7.30). The subjects shown on the screen illustrate the structure of comb, the different stages of the young bee from the egg upwards, photo-micrographs of different parts of the bee, various forms of hives, operations in bee keeping, &c. All are photographs from nature, not diagrams. I do not think it would be practicable to use an oil lamp for the purpose.

Eastman's Solio Paper.—This company have decided to give their gelatino-chloride paper a trade name, by which it may be known throughout the world, the name decided upon is Eastman's Solio Paper.

An Amateur Saturator and Jet.

No. II.

By Clericus.

The Jet.—This is, perhaps, somewhat more difficult to make than the Saturator. But as I shall describe only what I have myself actually made, with appliances at the command of any amateur, no one need hesitate to attempt the task of construction.

We begin with the gas-chamber, *a*, Fig. 1. It is formed of a piece of brass tube 1 in. diameter and ¾ in. long. It has a screw thread cut inside from end to end, and two plates or discs of brass are made with a corresponding thread cut on the edge, so as to screw in and form the top and bottom of the chamber. The fitting of these in is no doubt a matter that requires care. They must fit so perfectly as to be quite gas-tight, even under a considerable pressure of gas. If the nozzle is of fair length—two inches or so—there is little risk in soldering the plates in. With careful work, however, a sound joint may be made without the aid of the soldering-iron. Let the plates screw in tightly, screw them down a trifle below the edge of the tube, rub a little soft lead into the joint, and then carefully tap it round with a hammer so as to spread the projecting edge of the tube over the joint.

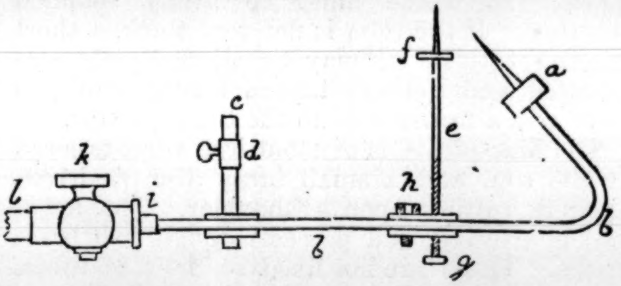


Fig. 1.

Before this is done, however, the side tubes *b*, must be made and fixed into the bottom plate. There are, of course, two of these, but one only is shewn in the figure for the sake of clearness. They are made of brass, or better still, copper tubing, solid drawn by preference, ¼ in. diameter and about 7½ in. long. One end of each must have a screw cut for a short distance upon it, and two holes similarly cut in the bottom plate as close together as possible. One of the side tubes is bent as at *b'*, so that the shorter branch forms an angle of about 50° with the longer. This is fitted into the bottom plate, and then the other is also screwed in, and bent to match.

For the nozzle I used that of a disused oil can, part of a cycle outfit, which proved the spiral spring, this at once ejects the cylinder as soon as pressure is removed, and the tubular cutter having a number of holes in its sides, prevents dust from the lime accumulating and thus wedging it in.

Now for a word of caution, and a very important one too. Care must be taken when pressing the lump of lime against the saw that the palm of the hand does not come in contact with the teeth of the saw, else will a hole be cut in the hand ere one is aware of it, for it must not be forgotten that this is the most dangerous form of circular drill that can be used.

—:o:—

New form of Ether-Oxygen,

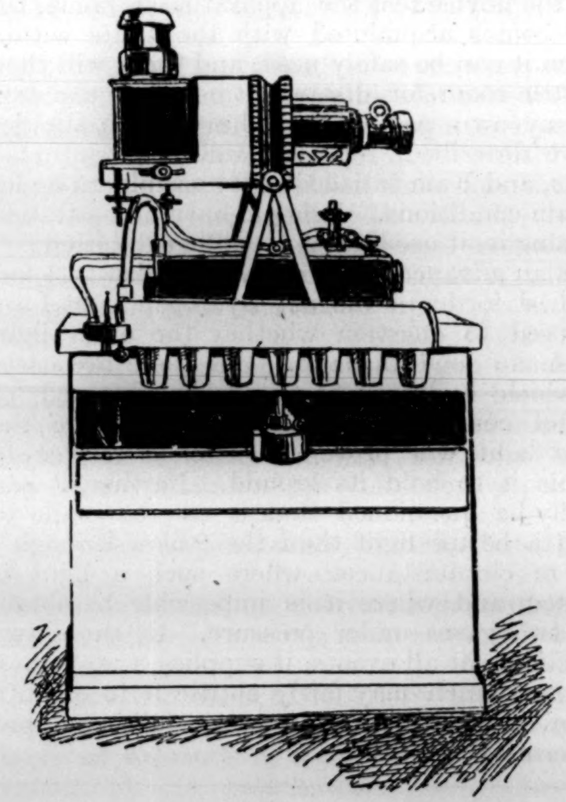
WITHOUT OXYGEN BOTTLE.

A NOVEL form of lantern outfit in which the oxygen is made and saturated with ether as required, has been devised by Mr. Geo. R. Prouse. In a recent description before the Royal Society of Canada, he stated that the apparatus has been designated the Ethoxycon, as indicating the use of ether and oxygen. It combines both the lantern proper and the gas generator and storage bag or receiver. In general terms, the generating and storage parts consist of a generator or retort for the production of oxygen gas, a filter or washer, a saturator, a regulator and a storage gas receiver. All of these, together with the lantern proper, are contained in a box or case which measures 10 by 18 by 18 inches. This also serves as a stand for the lantern when in use.

The details of construction and operation are as follows:

The lantern proper, or the optical part of the instrument, consists of the ordinary lens system for enlarging, projecting and focusing the image of the object as illuminated by rays of light passing through a condenser. These parts are all comprised in a small case of wood and metal, in which is placed a 4-inch condenser—this size being ample to cover the aperture of an ordinary lantern-slide three inches square. The back case of the lantern is provided with a sliding adjustment to establish the proper focal relations between the lens and the condenser. The spindle upon which the lime is placed is also provided with the usual means for transverse and vertical adjustment and adjustment of the jet relatively to the lime. An important feature consists of means for vertical adjustment of the entire instrument. This is affected by having the body hung on pivots at the summit of two metal triangles. From each pivot there depends an arm carrying at its lower extremity a clamp operated by a thumb screw. This latter passes through and engages upon a short arc opening in each triangle in such a way that the body of the lantern may be adjusted horizontally, or vertically above and below this position within an extreme range of about thirty degrees, the position desired being firmly secured by the clamping action of the thumb screws.

The generator consists of an iron or steel tube with a semi-circular cross-section. Into the flat or lower side are inserted a number of copper cups, each of a capacity to contain sufficient mixture to contain the light for about fifteen minutes. The different rates of conduction in the two metals of the retort serve two purposes. The copper being a rapid conductor, brings about a speedy fusion of the chlorate of potash, which quickly gives off gas. The iron, by its slower conductivity, serves to retard the transmission of heat from cup to cup, thereby prevents action taking place in any cup not directly heated, and secures complete control of the whole operation. Each cup is heated in turn by means of a spirit lamp or a small Bunsen burner, as may be desired, the transfer of heat from one to the other being affected automatically by an attachment which is operated by the receiver when the gas has reached a certain degree of exhaustion.



The washer, saturator and regulator are combined in one piece, measuring 7.5 by 12.5 by 30.5 cm. This is placed directly beneath the body of the lantern between the triangular supports. The central longitudinal section is occupied by the washer. This consists of a tube arranged with fine wire cloth, and filled with a moist filtering substance, which serves to arrest any particles of carbon or other similar impurities which may pass over from the retort. On each side of the washer is a similar tube filled with pine-wood sawdust, which is charged with sulphuric or petrolic ether, as may be desired. The form of saturator is an improvement upon that usually employed, while the construction is such as to avoid all possibility of explosion. Toward one, and directly over the washer, is a small standpipe with two stop-cocks and a regulator. The latter consists of a rubber diaphragm, upon which rests a lead disc weighing about 136 grammes. The amount of gas passing through from the regulator to the burner is determined by the adjusmtent of two needle-point valves, one for each gas, and thus the production of a brilliant light is readily secured.

The gas receiver is contained in the case which holds the entire instrument when in transport. It consists of a rubber bag, having a capacity of nearly one foot, the upper part of which is formed of a tin pan working upon two upright metal posts, one of which serves as a tube for the conveyance of gas to and from the receiver. Into the pan there is loosely fitted a second pan, designed to be filled with water in order to establish the necessary pressure. Upon the front edge of the first pan are a number of catches designed to engage a spring and automatically transfer the source of heat from cup to cup as the pan descends during the exhaustion of the contained gas.

To place the lantern in operation the case is located in the disired position and all the movable parts are removed. The loose pan is next filled with water to about two-thirds or three-fourths its capacity and placed in position. The rubber tube supplying gas to the receiver is next attached to its corresponding metal tube and passed through a hole in the cover made for this purpose, the latter being closed down. Two metal rods projecting from the front of the cover are then drawn out as supports for the retort, and the lantern is placed in position on the top of the case.

Black oxide of manganese (MnO_2) and chloride of potash ($KClO_3$) in the proportions of 1 to 3 are now thoroughly crushed and mixed. If the crystals of chloride are fine thorough mixing with a spoon will suffice, but if large it will probably be found better and more expeditious to pass the mixture through an ordinary coffee mill. A metal trough of the form and length of the retort is now filled with the mixture, passed into the inverted retort, the whole reversed and the charger or trough withdrawn. In this process each cup will be filled and any excess of material discharged as the trough is drawn out. The head of the retort is next firmly clamped on, the retort is placed in position on its supports, and the lamp adjusted to the first cup on the right. A large rubber tube is now connected with the retort at one end and with the washer at the other, while the small tube leading from the receiver is also attached to the washer. After making certain that all connections are perfectly tight, heat is applied. If sufficient, gas will form in two and one-half minutes, the first indications will be in a slight action of the receiver, followed by an elevation of the regulator to its full height. The pan now rises rapidly, and, under favorable conditions, the light should be on the screen within five minutes from the first application of heat to the retort. When alcohol is used in generating the gas a somewhat longer time must be allowed for.

The distribution of the gas takes place in the following manner: As fast as it generates it passes from the retort to the washer, whence it returns by a smaller tube to the receiver, in which the surplus is stored. From the washer it also enters the standpipe and regulator, which latter determines a uniform pressure in the gas supplied to the jet, thereby securing a steady light. From this point, as regulated by the needle-valves, the gas is led by two separate channels to the point of consumption. One valve transmits pure oxygen directly from the washer. The other causes a certain volume of oxygen to pass downward into one of the saturators, from which it passes into the second, and thence directly to the burner. In its course it becomes supersaturated with ether, and therefore constitutes the substitute for the ordinary hydrogen gas employed where separate gasses are used.

The capacity of the retort is such that sufficient gas may be generated to operate the light continuously for about two hours. Two or more retorts will be found of advantage, and by their use continuous service may be secured for any length of time.

The exhausted charges may be speedily removed from the retort by placing the latter on end under a tap and using a free supply of water. If the latter be heated the operation will be facilitated. If not immediately needed, the retort may then be placed on end with the mouth downward, to thoroughly drain and dry. No accumulation of moisture should be allowed, since it passes into the tubes, clogs the passage very thing. The aperture can be made of any required size by simply cutting off the end, if necessary. And the larger end has a screw upon it, which must be screwed into the top plate of the gas chamber. The hole in the plate to receive the nozzle can be cut by means of a screw-tool corresponding to the pitch of the screw on the nozzle. Care must be taken that none of the tubes project too far into the interior of the chamber.

Next comes the tube *c*, which is ½ in. diameter and about 3½ in. long. It passes between the side tubes, and also through two plates of brass, one above and one below, as shewn in the figure. All these must be firmly soldered together. If the tube is not very thick, a short length of tube, *d*, may be slipped over and soldered, and the hole tapped through both, so as to give a firmer hold to the thumb-screw.

The lime-pin, *e*, is of stout iron wire, tapered at the top, and a small brass disc, *f*, driven upon it, resting upon a shoulder. The lower part is screwed, and passes through two brass plates. These are not fixed to the side tubes, but slide freely along, so as to bring the lime to any required distance from the nozzle. A button, *g*, serves to turn the pin, and thus raise or lower the lime. A screw, *h*, passing freely through the upper plate and screwing into the lower, keeps it into position.

The taps, *k*, must now be fixed. These will have to be bought, as no amateur will think of trying to make them. They may be obtained at almost any gas-fitters, and should be as small as can be got. The side tubes will be too close together to allow of their being properly fixed. But this can easily be remedied by bending them apart to the extent required. If the ends of the taps are too large—as they almost certainly will be—to fit the side tubes, a short piece of larger tube may be screwed into the tap, and soldered to the side tube, as at *i*. Lastly, the other end of the tap will probably be too short for the rubber tube to be sprung upon it. In that case an inch or two of tube, *l*, must be screwed or soldered into the end of the tap, and the rubber sprung upon this.

Since making the above jet I have finished another with a few modifications in the direction of greater completeness. These I hope to describe in a future paper. Meanwhile I may add a few words of advice, the result, so far, of my own experience.

Neither this nor any similar jet should ever be used without a pair of flame extinctors. Those which I use are simple and easily made. Each consists of two parts, A and B, Fig. 2. The lower part, B, is formed of three tubes, slipped one into another and soldered together. The largest of these, which is really the extinctor, should be not less than ½ inch diameter and an inch long. At *b*, resting on the shoulder formed by the second tube, is a disc of wire gauze—No. 50 gauge—and the chamber thus formed is filled with powdered pumice. The upper part A is formed of two tubes, the lower one made to screw into B, and another disc of gauze is soldered just within the end at *a*. This being screwed down into B, the rubber tubes are sprung upon *a′* and *b′*. These extinctors should be fixed immediately behind the jet taps, by short pieces—two inches or so—of *stout* rubber tube. The pumice is prepared by sifting it, when pulverized, through wire gauze, first through No. 40 gauge and then through No. 50. All that passes the first but will not pass the second is proper to be used.

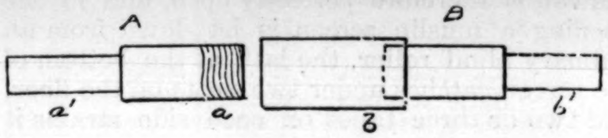


Fig. 2.

The ether which has drained out of the saturator should not be used again without being mixed with at least an equal quantity of fresh.

Do not use too large an aperture. It should not much exceed 1-25th of an inch. Increasing the size of the aperture will give a worse light instead of a better (to say nothing of other objections) unless the gas chamber and pressure of gas be also increased.

The ether vapour, when lighted, should heat the lime to a red heat. If, before the pure oxygen is turned on, there is a *glow* upon the surface of the lime, it is a pretty sure indication, that the oxygen is not sufficiently saturated, and the light will snap when the oxygen is turned on. This probably arises either from using too large an aperture, or from the ether becoming exhausted. In either case the remedy is obvious. In a cold room it is sometimes an advantage to place the saturator—removing it from the stand—upon a stone bottle filled with boiling water, and cover the whole with a fold or two of flannel.

The ether vapour should always be sent to the left hand tap of the jet; and the pure oxygen to the right hand. This latter should not be turned on until the light has been burning for several minutes. In putting out the light, turn off the oxygen first.

Do not attempt to get more out of an apparatus than it is calculated to perform. I have seen it stated that the ether light is " the most powerful light known." I question—though I do not say it as the result of actual experiment—whether under any circumstances, the ether light, as at present used, is superior to the best mixed-gas jet. And, if any one thinks that by procuring a saturator, turning on the taps at full, and applying a match, he will at once get a light better than all others, he will be tolerably certain to be disappointed. But every apparatus must be used with care and reason. And I do not hesitate to say that, reasonably used, even the jet above described will give a light, *at least* equal to the best "blow-through" with quite as little trouble, and scarcely any more apprehension of danger. I would not recommend any one to make his first attempt at using a saturator at a public exhibition. But one would hardly do that even with a paraffin lamp. Let the novice test the apparatus at home, till he becomes acquainted with the limits within which it can be safely used, and there will then be little room for disappointment. I can say, for my own part, that I have given the jet above described, repeated and long-continued trials, and I am satisfied of its usefulness under certain conditions. I should have no hesitation in using it, if needful, at a public exhibition.

As an advance upon, or even a substitute for, the best forms of the oxy-hydrogen light I am disposed to question whether the ether light can make good its claim. But there are cases in which hydrogen is not to be obtained, or cannot conveniently be used, and there the ether light will prove of sufficient service to enable it to hold its ground. Further, it can hardly be questioned that it can be made to yield a better light than the "blow-through" jet, in circumstances where such a light is wanted, and where it is impossible to obtain the two gases under pressure. In these two directions, at all events, it supplies a want in a manner which may fairly entitle it to claim a place in the outfit of every fully-equipped lanternist.

—:o:—

Turning Limes.

By D. D.

In looking over one of the recent numbers of this journal, I observed that a correspondent asked some particulars upon the above subject. I have not yet seen any reply to the question, so hope the few particulars I may be able to supply, will be of use to my fellow-workers.

With regard to the kind of lime to employ, and the means of obtaining it, I shall not deal, but will assume that a supply of soft lime is at hand. One of the chief difficulties with the non-initiated is the method of holding the lime in the lathe, and another is the difficulty of cutting it if it has by any means become secured in its place.

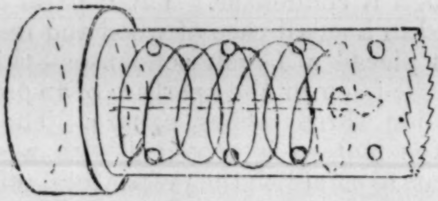
The very fact of speaking of *turning* limes impresses us with the fact that a turning lathe is utilized for the purpose, but although it is used, it is not best employed for making the lime rapidly rotate at which time a cutter is applied to the surface of the lump of lime.

The most preferable method is to make the cutter revolve and apply the lime to this. Respecting the style and shape of the cutter, a periphery saw is that best adapted for the purpose. This, roughly speaking, may be a piece of thin steel tubing, on the edge of which have been cut saw-like teeth. These should have a very slight set, that is, each alternate tooth should bend a little outwards and the others slightly inwards. The reason for this is to enable the fragile lime to be readily cut, and also to enable it to have just sufficient freedom when partly in the tube to prevent it twisting and thus crumbling. The saw having been set spinning round by reason of its being attached to a chuck in the lathe, a lump of lime is held to the edge with slight pressure, which causes a portion to gradually enter the tubular cutter.

This, in a general way, is the manner of cutting, but the question will arise, how about making a hole *exactly* in the centre to enable it to be placed upon the lime-pin of the jet. To apply the lime cylinder to a revolving drill will certainly make a hole through the lime, but the chances are ten to one that the hole will not be central.

In order that the hole be quite true and central, it is necessary that the cylinder be shaped, and the hole cut at one and the same operation.

The accompanying cut will show how this may be done. The drill must be fixed in the centre of cutter, so that they both run true. This drill should have a spear-point, so as to enable it to clear its way.



Again, it may be asked, supposing the lime to be cut and the hole drilled through it, how is it to be got out of the tubular cutter. From the cut it will be observed that when the lime is pressed against the saw edge, it pushes back a disc, which is kept near the outer edge by a spiral spring, this at once ejects the cylinder as soon as pressure is removed, and the tubular cutter having a number of holes in its sides, prevents dust from the lime accumulating and thus wedging it in.

Now for a word of caution, and a very important one too. Care must be taken when pressing the lump of lime against the saw that the palm of the hand does not come in contact with the teeth of the saw, else will a hole be cut in the hand ere one is aware of it, for it must not be forgotten that this is the most dangerous form of circular drill that can be used.

—:o:—

New form of Ether-Oxygen,

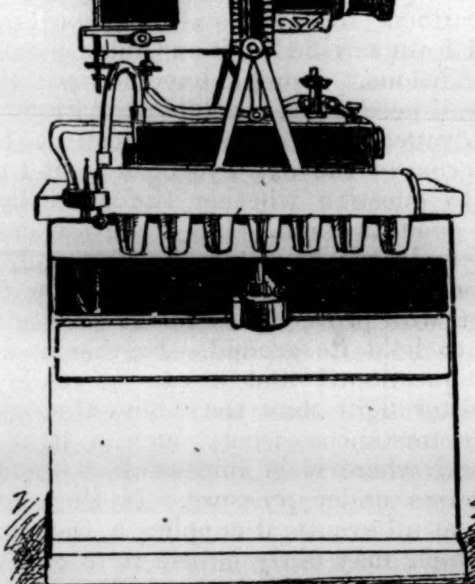
WITHOUT OXYGEN BOTTLE.

A NOVEL form of lantern outfit in which the oxygen is made and saturated with ether as required, has been devised by Mr. Geo. R. Prouse. In a recent description before the Royal Society of Canada, he stated that the apparatus has been designated the Ethoxycon, as indicating the use of ether and oxygen. It combines both the lantern proper and the gas generator and storage bag or receiver. In general terms, the generating and storage parts consist of a generator or retort for the production of oxygen gas, a filter or washer, a saturator, a regulator and a storage gas receiver. All of these, together with the lantern proper, are contained in a box or case which measures 10 by 18 by 18 inches. This also serves as a stand for the lantern when in use.

The details of construction and operation are as follows:

The lantern proper, or the optical part of the instrument, consists of the ordinary lens system for enlarging, projecting and focusing the image of the object as illuminated by rays of light passing through a condenser. These parts are all comprised in a small case of wood and metal, in which is placed a 4-inch condenser—this size being ample to cover the aperture of an ordinary lantern-slide three inches square. The back case of the lantern is provided with a sliding adjustment to establish the proper focal relations between the lens and the condenser. The spindle upon which the lime is placed is also provided with the usual means for transverse and vertical adjustment and adjustment of the jet relatively to the lime. An important feature consists of means for vertical adjustment of the entire instrument. This is affected by having the body hung on pivots at the summit of two metal triangles. From each pivot there depends an arm carrying at its lower extremity a clamp operated by a thumb screw. This latter passes through and engages upon a short arc opening in each triangle in such a way that the body of the lantern may be adjusted horizontally, or vertically above and below this position within an extreme range of about thirty degrees, the position desired being firmly secured by the clamping action of the thumb screws.

The generator consists of an iron or steel tube with a semi-circular cross-section. Into the flat or lower side are inserted a number of copper cups, each of a capacity to contain sufficient mixture to contain the light for about fifteen minutes. The different rates of conduction in the two metals of the retort serve two purposes. The copper being a rapid conductor, brings about a speedy fusion of the chlorate of potash, which quickly gives off gas. The iron, by its slower conductivity, serves to retard the transmission of heat from cup to cup, thereby prevents action taking place in any cup not directly heated, and secures complete control of the whole operation. Each cup is heated in turn by means of a spirit lamp or a small Bunsen burner, as may be desired, the transfer of heat from one to the other being affected automatically by an attachment which is operated by the receiver when the gas has reached a certain degree of exhaustion.



The washer, saturator and regulator are combined in one piece, measuring 7.5 by 12.5 by 30.5 cm. This is placed directly beneath the body of the lantern between the triangular supports. The central longitudinal section is occupied by the washer. This consists of a tube arranged with fine wire cloth, and filled with a moist filtering substance, which serves to arrest any particles of carbon or other similar impurities which may pass over from the retort. On each side of the washer is a similar tube filled with pine-wood sawdust, which is charged with sulphuric or petrolic ether, as may be desired. The form of saturator is an improvement upon that usually employed, while the construction is such as to avoid all possibility of explosion. Toward one, and directly over the washer, is a small standpipe with two stop-cocks and a regulator. The latter consists of a rubber diaphragm, upon which rests a lead disc weighing about 136 grammes. The amount of gas passing through from the regulator to the burner is determined by the adjusmtent of two needle-point valves, one for each gas, and thus the production of a brilliant light is readily secured.

The gas receiver is contained in the case which holds the entire instrument when in transport. It consists of a rubber bag, having a capacity of nearly one foot, the upper part of which is formed of a tin pan working upon two upright metal posts, one of which serves as a tube for the conveyance of gas to and from the receiver. Into the pan there is loosely fitted a second pan, designed to be filled with water in order to establish the necessary pressure. Upon the front edge of the first pan are a number of catches designed to engage a spring and automatically transfer the source of heat from cup to cup as the pan descends during the exhaustion of the contained gas.

To place the lantern in operation the case is located in the disired position and all the movable parts are removed. The loose pan is next filled with water to about two-thirds or three-fourths its capacity and placed in position. The rubber tube supplying gas to the receiver is next attached to its corresponding metal tube and passed through a hole in the cover made for this purpose, the latter being closed down. Two metal rods projecting from the front of the cover are then drawn out as supports for the retort, and the lantern is placed in position on the top of the case.

Black oxide of manganese (MnO_2)and chloride of potash ($KClO_3$) in the proportions of 1 to 3 are now thoroughly crushed and mixed. If the crystals of chloride are fine thorough mixing with a spoon will suffice, but if large it will probably be found better and more expeditious to pass the mixture through an ordinary coffee mill. A metal trough of the form and length of the retort is now filled with the mixture, passed into the inverted retort, the whole reversed and the charger or trough withdrawn. In this process each cup will be filled and any excess of material discharged as the trough is drawn out. The head of the retort is next firmly clamped on, the retort is placed in position on its supports, and the lamp adjusted to the first cup on the right. A large rubber tube is now connected with the retort at one end and with the washer at the other, while the small tube leading from the receiver is also attached to the washer. After making certain that all connections are perfectly tight, heat is applied. If sufficient, gas will form in two and one-half minutes, the first indications will be in a slight action of the receiver, followed by an elevation of the regulator to its full height. The pan now rises rapidly, and, under favorable conditions, the light should be on the screen within five minutes from the first application of heat to the retort. When alcohol is used in generating the gas a somewhat longer time must be allowed for.

The distribution of the gas takes place in the following manner: As fast as it generates it passes from the retort to the washer, whence it returns by a smaller tube to the receiver, in which the surplus is stored. From the washer it also enters the standpipe and regulator, which latter determines a uniform pressure in the gas supplied to the jet, thereby securing a steady light. From this point, as regulated by the needle-valves, the gas is led by two separate channels to the point of consumption. One valve transmits pure oxygen directly from the washer. The other causes a certain volume of oxygen to pass downward into one of the saturators, from which it passes into the second, and thence directly to the burner. In its course it becomes supersaturated with ether, and therefore constitutes the substitute for the ordinary hydrogen gas employed where separate gasses are used.

The capacity of the retort is such that sufficient gas may be generated to operate the light continuously for about two hours. Two or more retorts will be found of advantage, and by their use continuous service may be secured for any length of time.

The exhausted charges may be speedily removed from the retort by placing the latter on end under a tap and using a free supply of water. If the latter be heated the operation will be facilitated. If not immediately needed, the retort may then be placed on end with the mouth downward, to thoroughly drain and dry. No accumulation of moisture should be allowed, since it passes into the tubes, clogs the passage of the gas, and tends to produce an unsteady light.

The washing tube should be cleaned out occasionally with fresh water to prevent clogging. The saturator needs only occasional replenishing. With due attention to these directions and the ordinary prudence which must at all times be exercised in the use of highly explosive substances, this lamp is capable of affording a brilliant and satisfactory light, with perfect safety to the operator and a minimum of expense and trouble. The cost of operating the lamp, so far as can be determined from present experience, is about 15 cents per hour.

The apparatus is patented in Europe and America.

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Memo from my Note Book.

LANTERNS AT EXHIBITION OF 1851,

BY RICHARD EMPSON.

As I am growing old it is quite natural to suppose that my lantern days are rapidly drawing to a close, for at the time of the famous exhibition of '51, I was by no means a young man. At that time I was connected with the press and was detailed to describe many of the scientific exhibits. From my early days I have been an enthusiastic lanternist, and from the day I first came across the *Optical Magic Lantern Journal*, I have been greatly adding to my store of knowledge, in return for which I gladly give my impression of lanterns, taken from my note book of forty-two years ago.

The phantasmagoria lanterns exhibited are a scientific form of magic lantern, differing from it in no essential principle. The images they produce are variously exhibited either on opaque or transparent screens. The light is an improved kind of solar lamp.

The manner in which the beautiful melting pictures called dissolving views are produced, as respects the mechanism employed, deserve to be explained. The arrangement adopted in the instrument exhibited is the following:—

Two lanterns of the same size and power, and in all respects exactly agreeing, are arranged together upon a little tray or platform. They are held fast to this stand by screws, which admit of a certain degree of half revolving motion from side to side in order to adjust the foci. This being done in such a manner that the circle of light of each lantern falls precisely upon the same spot upon the screen, the screws are tightened to the utmost extent, so as to remove all probability of further movements. The dissolving apparatus consists of a circular tin plate, japanned in black, along three parts of its circumference of which a crescentic aperture runs to the interval between the horns of the crescent, being occupied by a circular opening covered by a screwed plate removable at pleasure.

This plate is fixed to a horizontal wooden axis at the other end of which is a handle, by which the plate can be caused to rotate. The axis of wood is supported by two pillars connected with a flat piece which is secured to the tray. This apparatus is placed between the lanterns in such a manner that the circular plate is in front of the tubes of both, while the handle projects behind the lantern at the back. The plate can, therefore, be turned round by means of the handle without difficulty from behind.

A peg of wood is fixed into the axis so as to prevent its effecting more than half a revolution. The widest part of the crescentic opening in the plate is sufficiently so to admit all the rays of the lantern, before which it happens to be placed.

On the plate being slowly turned half round, by means of the handle behind, the opening narrows until it is altogether lost in one of the horns of the crescent. The light of that lantern is gradually cut off as the aperture diminishes, until it is at length wholly shaded under the moveable cover occupying the interval between the horns of this crescentic opening.

In proportion as the light is cut off from one, it is let on from the other tube in consequence of the gradually increasing size of the crescent revolving before it, until at length the widest part of this opening in the plate is presented before the tube of the second lantern, the first being, as we have seen, shaded. This movement being reversed, the light is cut off from the second lantern and again let on from the first, and so on alternately. Thus, while the screen always presents the same circle of light, yet it is derived first from one lantern then from the next.

When in use, a slide is introduced into each lantern. The lantern before the mouth of which the widest part of the opening in the plate is placed, exhibits the painting on the screen; the light of the other lantern being then hid behind the cover. On turning the handle, the picture gradually becomes shaded, while the light from the second lantern streams through the widening opening. The effect on the screen is the melting away of the first picture and the brilliant development of the second, the screen being at no instant left unoccupied by a picture.

The principal involved of this apparently complex, but in reality simple mechanism, is merely the obscuration of one picture and the throwing of the second in the same place on the screen ; and, it may be accomplished in a great variety of ways. Thus, by simply placing a flat piece of wood somewhat like the letter Z one a point in the centre, so that alternately on or the other of the pieces at each end should be raised or depressed before the lantern, a dissolving scene is produced. Or by fixing a moveable upright shade which can be pushed alternately before one or other of the lanterns, the same effect is produced. Individuals exist in this metropolis whose sole occupation consists in painting the minute scenes or slides used for the phantasmagoria lanterns.

The perfection to which these paintings are brought is surprising. There are two methods by which the slides now employed are produced. In one of these the outline and detail are entirely the work of the artist's pencil. For pictures representing landscapes, or whatever spirited painting is required, this is the exclusive method employed. The colours are rendered transparent by being ground in Canada balsam and mixed with varnish. The other is a transfer process. The outlines of the subject are engraved on copper plates, and the impression is received from these on a thin sheet of glue, and is then transferred to a plate of glass, the impression being burnt in the same manner as is effectied in earthenware. Slides produced in this way receive the distinctive name of copper-plate slides. The subject is merely represented in outline, it being left to the artist to fill up with the necessary tints, &c.

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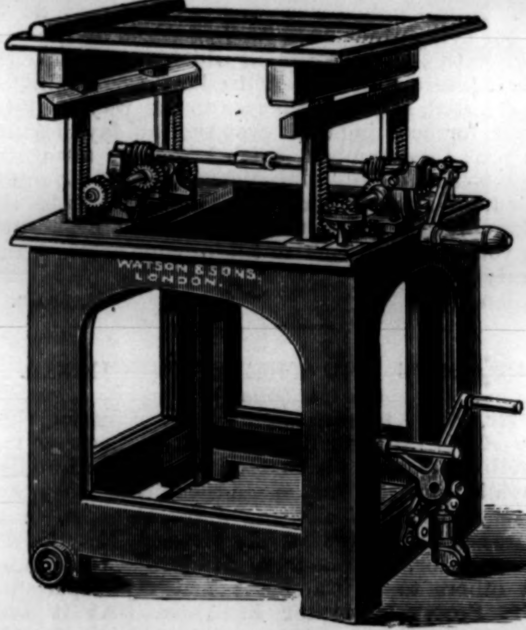
Editorial Table.

Catalogue.—The twenty-third annual supplementary list of slides issued by Messrs. York & Son is to hand. The first part contains a pithy account of the various new stories, each condensed into about a dozen lines, whilst in the second portion the titles of each slide in the respective sets are given. We observe that several new slides have been added to the set of "London and Neighbourhood." Scotland comes in for a fine set. Introductory, curtains, mottoes, maps, temperance sets, and comics are also represented in goodly numbers.

Photo-Enlargements, How to Make Them.—This 1s. Practical Handbook, by Mr. George Wheeler, 46, King Street, Manchester, contains very useful instructions for those interested in enlarging. Rough and smooth paper, negatives, daylight and artificial light, exposure, vignetting, development, mounting, toning, and a host of other subjects are ably commented upon and explained, both by words and sketches. This excellent book contains about 130 pages.

Adjustable Lantern Stand.—A convenient studio-camera and lantern stand has been introduced by Messrs. Watson & Son. Every desired movement can be obtained by the operator from one position. The stand can be wheeled along and the wheels thrown out of gear by pressure on a pedal. Should the flooring be slightly uneven a screw adjusts the length of the four legs until they stand solid. By means of the handle shown, the stand may be raised or lowered, inclined upwards and downwards and then again raised or lowered with the table at the desired angle. We have tried this stand with a very heavy load placed on top, and found it very easy to make the desired adjustments.



Slides of Bees.—Those who are interested in Bee keeping should see the photographs just taken by Mr. T. E. Freshwater, of Bees and Bee Culture, and of the way that they can be handled by one, such as Mr. Broughton Carr, who is an expert, the bees even crawling over his hand. Hiving a swarm, catching the queen, bees returning to hive, driving the bees, taking a swarm in the middle of a tree, and manipulating the hives, are wonderful pieces of photographic skill. Then there are some photomicrographs of the parts of the bee, so that any one wishing to study the anatomy of this insect, can do so without the aid of the microscope. The above photographic slides will be published by Messrs. Newton & Co.

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Correspondence.

FREE ADVERTISEMENT SLIDES—SHORT TALES WANTED.

[*To the Editor.*]

Dear Sir,—I see in last notes about some of your readers not being able to obtain the free slides. I applied immediately after seeing the notice, and received a note from them saying they were out of stock, but have since received them from two of the firms, but as they are simply copies of well-known advertisement pictures, I don't think the venture will do them much good, as they are not very suitable for exhibitions, and, in my opinion, but few lanternists will keep them in their cases.

I would also remark, for the benefit of slide makers, on the scarcity of good short tales (say half an hour) suitable for Band of Hope and Sunday School work. I mean something with a good healthy ring about them. Why not adapt some of Kingston's books, and many others of the same class? We do not want goody goody or preaching for an entertainment, and the main tales suitable at present consist of a brief history of some unfortunate street arab, who, after many ups and downs, mostly downs, ends his or her career by dying in a hospital. Now, sir, however much good it may do us to have our sympathies awakened, children do not care to always go to an entertainment which finishes up with a good cry. Surely now that the lantern is being so extensively used, something better in the way of slides ought to be forthcoming than even the Sunday pleasure story in your June number, which I venture to suggest is, though splendidly full of incidents, rather too much overdrawn, and, in my humble opinion, would miss the moral for children, and not be appreciated by adults, trusting you will kindly notice this in your next.—I am, yours truly,

Abingdon. R. Moss.

SATURATORS AND THEIR EFFICIENCY.

[*To the Editor.*]

Sir,—Mr. Scott protests against my remarks, that the form of his saturator fails in fully saturating the gas, by telling us what his customers say. As I understand public journals for special subjects, they are for the very purpose of eliciting different experiences. I of course spoke comparatively between Mr. Scott's upright saturator, and the form which has been found by most others to be the best; and my experience with Mr. Scott's saturator has been that it does not saturate so thoroughly as one in which the gas *must* make a *long* circuit. I did not say that it could not be used, but I consider that what is gained in having an upright saturator, to which heat can be applied to the upper part of the cylinder, is lost by the fact that the gas *may* take a short cut and not get fully saturated, that is exactly what I found with Mr. Scott's instrument after it had been in use some time. But that was not what induced me to write about the matter, it was to object to Mr. Scott's claim upon an entirely different form of saturator, in which heat was applied in a different manner to that specified in his patent. He says that is a "matter for a patent agent." I had hoped that Mr. Scott would disavow his claim when you had made extracts from his patent. If his claim is good, let him act on that belief and stop the proposed maker.

Yours, &c.,
Birmingham. A. Pumphrey.

REFLECTORS.

[*To the Editor.*]

Sir,—From a few simple experiments I made a year ago, I was fully confirmed that there could be a very great improvement made in the illuminating capabilities of the common reflector, and intended at the time to drop a note to the *Optical Magic Lantern Journal* in the hope that some practical experimentalist would take up the matter. Now I am agreeably surprised to find, by your issue for August, that Mr. W. Stocks, of Rye has, partially, or possibly almost, succeeded in perfecting a reflector which I hope will throw all others in the shade. For rural school purposes we want simplicity in the lighting of optical lanterns, sufficient ventilation around oil reservoir, good lamp, and if a size large, no matter. I shall possibly revert to the subject of oil lamps at a future time, if you will kindly permit me to do so, and give a few ideas which may chance to be of use to lanternists.—Yours faithfully,

Dundrum, Down, Ireland, Wm. Jackson Pigott.
August 22nd, 1892.

Notes and Queries.

Gas writes: "I have an oxygen cylinder full of gas; will the gas oxide the inside of the cylinder so as to damage it? The gas has been in over two months." *Answer.*—No.

W. Lawson.—We shall look forward to arrival of saturator, and will have pleasure in trying it.

Optic.—Yes, the aphengoscope is a useful adjunct. You will find an account of a very good one in our issue for January, 1890. We may have something to say upon this subject in our next.

W. E. Galloway.—If you are using an oil light, you will probably find a metal stop soldered inside the lantern, to prevent the lamp from going close to the condenser. We have on several occasions known this stop to be placed in the wrong position. If you remove it you may remedy your difficulty respecting a clear disc. If you employ limelight perhaps the curve of the tube to the nipple is such that your light cannot approach near enough to the condenser to enable the longer focus of lens to be used. We think the triple, with adjustable outer condensing lens will be the condenser of the future.

Wm. Roach.—You will find an account of Bible slides in the advertisement of Messrs. Mitchell & Co., in the pages of this issue devoted to advertisements.

Young Artist.—Use crayon for the hatching.

Hampton Judd & Co.—Received.—In our next.

Show Bill writes: "Where can I obtain coloured hand bills and posters in connection with lantern entertainments? I have been told that effective styles ready for the particulars of the show to be printed on them, can be obtained, but do not know if it is so; perhaps you, whom the readers look upon as an encyclopædia, can give me particulars and price, also if you happen to have an odd one perhaps you could forward it on to me, and I will remit stamps for postage." *Reply.*—We have an idea either Messrs. Appleton or Riley Bros. publish something of the sort, but do not know the price.

Fred Fellowes explains that he intends making a screen, and asks if any reader has tried the mackintosh screens mentioned in this journal some time ago, and with what result, also who makes or deals in them. *Answer.*—Try Mr. F. W. Hart, 96, Stoke Newington Road, we believe he spoke of introducing them.

Amateur wants to know, "If I take a negative in my quarter-plate hand camera, and from it make two paper prints, trim a little more off one side of one compared to the other, and mount them side by side and place them in a stereoscope, will the picture appear in stereoscopic relief or will two pictures be seen as if squinting?" *Answer.*—You cannot obtain stereoscopic relief by the method suggested. The effect would be the same as if one picture were looked at. It would not appear double.

Hermit, J. Cokes, Ford, Jr., Subscriber, Printer and B.J.—We are sorry you had to write a second time, but as you will have seen from last issue, a number of letters were burned at the time our desk was consumed. However, rather than keep you waiting so long, we replied per return of post.

R. J. M.—We cannot endorse the remarks made by Mr. Holding about Mr. Stock's new reflector.

Light.—We can only refer you to reply to R. J. M. Your expression respecting the description given is certainly more expressive than elegant, hence we prefer not to print it.

W. L. Watts.—We applied for the slides in question but did not get them.

Duncan Milligan.—Several days before receiving your complaint, we had got instruction from Messrs. Mitchell & Co. to alter the heading of their advertisement.